Sanel Valley Groundwater Basin

- Groundwater Basin Number: 1-53
- County: Mendocino
- Surface Area: 5,570 acres (8.4 square miles)

Basin Boundaries and Hydrology

The Sanel Valley is an irregularly shaped northwest-trending structural trough located within the Coast Ranges of southeastern Mendocino County. This valley is approximately 6 miles long and has a maximum width of about 2 miles. The Sanel Valley Groundwater Basin is defined by the areal extent of Quaternary alluvium, which is bounded on nearly all sides by bedrock of the Franciscan Formation. A strand of the northwest-trending Maacama Fault Zone is exposed in outcrops of the Franciscan Formation near Knight Hill and extends beneath the northern part of Sanel Valley. The Sanel Valley Groundwater Basin is separated from the Ukiah Valley Basin near Knight Hill by a narrow constriction in Franciscan bedrock formed by passage of the Russian River.

The Russian River flows to the south through Sanel Valley and is joined near the town of Hopland by two tributaries, Feliz Creek on the western and McDowell Creek on the eastern sides of the valley. Precipitation in Sanel Valley averages ranges from approximately 32 to 40 inches per year.

Hydrogeologic Information

Water-Bearing Formations

Significant water-bearing formations that occur in the Sanel Valley include Alluvium and River-Channel Deposits, and Continental Deposits. Bedrock of the Franciscan Complex surrounds and underlies the Sanel Valley but due to its consolidated nature, it is essentially non-water bearing except for areas with significant fracture porosity. Information on water-bearing formations and groundwater occurrence was taken from Cardwell (1965) and DWR (1965).

Alluvium and River-Channel Deposits. These deposits are Holocene in age and consist largely of coarse sand and gravel with finer-grained deposits predominating outside the present and former channels. The thickness of these deposits varies considerably, but reportedly exceeds 50 feet in many locations. The maximum thickness of this unit is not known. The Alluvium is the principal source of groundwater in the Sanel Valley and is capable of providing sustained yields of 500 gpm or more to wells. Groundwater in these deposits is typically unconfined but may be semi-confined locally. An average specific yield value of 20 percent is commonly given to these deposits.

Continental Deposits. These deposits are Pliocene to Pleistocene in age and crop out in an area east and southeast of Hopland. They are at least in part age equivalent to the Glen Ellen Formation of the middle Russian River Valley. They consist primarily of massive, cross-bedded silty and clayey gravel and silty clay that originated from alluvial fans, lacustrine sediments,

and valley alluvium. These deposits are inferred from drillers' logs to underlie most of the alluvium east of East Hopland, in the Sanel Valley, and in McDowell Valley. The thickness of these deposits is not known; however, they are estimated to be at least 2,000 feet thick near the axis of the valley. Groundwater in this unit occurs under generally confined conditions. Groundwater production from this unit is highly variable ranging from less than 1 to 50 gpm; however, rare yields of 180 to 500 gpm have been reported. Published specific yield values for this unit were not identified.

Groundwater Level Trends

Groundwater elevation data from three wells in Sanel Valley area from the mid 1950's to the early 1980's show typical seasonal variations but no long-term declines (Farrar 1986).

Groundwater Storage

Groundwater Storage Capacity. Cardwell (1965) and DWR (1965) estimated a groundwater storage capacity of 20,000 af for the alluvium and river channel deposits between a depth of 10 and 50 feet assuming a specific yield of 20 percent.

Groundwater in Storage. No published values for the amount of groundwater in storage have been identified.

Groundwater Budget (Type C)

There is not enough data available in order to provide an estimate of the groundwater budget.

Groundwater Quality

Characterization. Groundwater in the Sanel Valley is a calcium bicarbonate or calcium-magnesium bicarbonate type and is generally good for all uses (Farrar 1986). TDS data from four wells ranged from 174 to 306 mg/L (Farrar 1986). EC data from four wells ranged from 287 to 8,500 μmhos/cm (DWR 1958). Mineral springs are numerous in Sanel Valley area and several have been developed for commercial use (Cardwell 1965).

Impairments. One sample with an elevated nitrate level above 10 mg/L was reported from an irrigation well in the south end of Sanel Valley (Farrar 1986). Carbon dioxide gas has been detected in some wells and in seeps and was produced from wells in the past for a dry ice plant located 2 miles north of Hopland (Farrar 1986; DWR 1958).
With respect to agriculture, elevated boron concentrations greater than 0.75 mg/L were reported in two wells north of Hopland (Farrar 1986).

Water Quality in Public Supply Wells

Constituent Group[1]	Number of wells sampled[2]	Number of wells with a concentration above an MCL[3]
Inorganics – Primary	5	1
Radiological	2	0

Nitrates	5	0
Pesticides	5	0
VOCs and SVOCs	5	0
Inorganics – Secondary	5	1

[1] A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).
[2] Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.
[3] Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Characteristics

Well yields (gal/min)

Well yields ranging from 750 to 1,250 with drawdowns of about 25 to 30 feet were observed from wells producing from alluvial deposits near the Russian River (DWR 1958).
Groundwater production from the Pliocene and Pleistocene continental deposits is highly variable ranging from less than 1 to 50 (Farrar 1986).

Total depths (ft)

Domestic	Range: 40 to 310	Average: 127 (based on 24 well completion reports)
Municipal/Irrigation	Range: 40 to 403	Average: 96 (based on 12 completion reports)

(DWR unpublished data)

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
DWR (incl. Cooperators)	Groundwater levels	4 wells semi-annually
Mendocino Co. Water Agency	Groundwater levels	5 wells monthly
DWR (incl. Cooperators)	Mineral, nutrient, & minor element.	4 wells biennially
Department of Health Services	Coliform, nitrates, mineral, organic chemicals, and radiological.	6 wells as required in Title 22, Calif. Code of Regulations

Basin Management

Groundwater management:	No groundwater management plans were identified
Water agencies	
Public	Mendocino County Water Agency, Hopland PUD
Private	

References Cited

California Department of Water Resources (DWR). 1958. Recommended Water Well Construction and Sealing Standards, Mendocino County. Bulletin No. 62.

_____. 1965. Water Resources and Future Water Requirements – North Coastal Hydrographic Area, Volume 1: Southern Portion (Preliminary Edition) – Bulletin No. 142-1.

Cardwell, G.T. 1965. Geology and Ground Water in Russian River Valley Areas and in Round, Laytonville and Little Lake Valleys, Sonoma and Mendocino Counties, California. USGS Water Supply Paper 1548.

Farrar, C.D. 1986. Ground-Water Resources in Mendocino County, California. USGS Water-Resources Investigations Report 85-4258.

Errata

Changes made to the basin description will be noted here.